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the use of his own funds for the construction of a suitable government building for his benefit, in which fire-proof construction shall insure the safety of invaluable records and where ample space and every convenience shall insure prompt attention to his business—the senior senator from Virginia has recently admirably stated the case :

“Other nations have surpassed us in literature and the fine arts, but in inventive and useful arts the United States is far transcendent. The Patent Office, established by Thomas Jefferson and protecting for a brief period the only constitutional monopoly, the right to the exclusive enjoyment of one's original ideas, is the crown of American intellectual supremacy over the material world, even as the Constitution of the United States is the crown of political architecture and the Union itself the crowning glory of our people.

“As Francis Bacon says, ‘The sciences dwell sociably together,’ and we should put on Capitol Hill, facing the Senate Hall, as a companion piece to the exquisite Library building now facing the Hall of Representatives, another building of like architecture. And the American capitol of letters should have by its side the American capitol of inventive art, both facing the Capitol of the people, where their sovereignty has its highest exemplification. In that hall should be displayed the evolutions of inventions, with every invention indicated by its model, inclusive of the last improvement. It would be the greatest college of applied science that the world has ever seen ; a monument to and a stimulus to invention, and leading by gradations to those truths of science which hover over the threshold of the age, ‘waiting to be caught.’”

R. H. THURSTON.

Photographic Optics. By OTTO LUMMER, Professor, Assistant in the Reichsanstalt, Berlin ; translated by Professor S. P. THOMPSON, London, Macmillan & Co.

A very complete and concise treatment of the theory of the modern photographic objective, with a full exposition of von Seidel's theory of aberration. The subject as a whole is rather deep for the general reader, though portions of

the book cannot but help interest any who desire to know more about the various modern objectives ; though they may not be able to penetrate the mysteries of the five different kinds of spherical aberration, and two chromatic aberrations which are taken into account in the computation of the complicated optical systems in use at the present time, they will find much of interest. A perusal of the book will at least give the photographer a respect for, and appreciation of his instrument far greater than can be had by the inspection of a few negatives and a glance at the optician's bill. A photographer should at least know as much about his lenses as an engineer knows about his engine, and yet how few can tell why the stop is placed in front of the lens-system in some cases and between the lenses in others, and to how many is a Zeiss ‘Planar’ anything more than a lot of pieces of glass stuck together and mounted in a brass tube. To the optician the book will be invaluable, it being practically the only work on the subject extant. R. W.

Geometrical Optics. By R. A. HERMAN, Fellow of Trinity College, Cambridge. Published at Cambridge by the University Press.

This book covers about the same ground as Heath's well-known work, which it resembles in some respects. The author has adopted a geometrical method instead of the usual analytical method in his treatment of refraction by coaxial surfaces and aberration, and makes use of the reduced path rather than the characteristic function in discussing Maxwell's theorems.

R. W.

DR. GRAY'S FAMILIAR TALKS ON SCIENCE.

A SERIES of little books, entitled ‘Nature's Miracles or Familiar Talks on Science’ (Fords, Howard and Hurlbut), has been published by Dr. Elisha Gray, and the third volume on ‘Electricity and Magnetism’ appeared shortly before his death, which occurred in January of the present year. Dr. Gray was unquestionably one of the prominent inventors who contributed his share to the very remarkable progress of electrical science and its application during the past thirty years. The claim often made for him that he was the inventor of the telephone is not justified by the

decisions of the courts. His work in connection with the harmonic telegraph, a very interesting invention which belongs to him, led him to an understanding of the principles underlying the telephone, and the caveat which he filed in the patent office showed that he was very close to the realization of his ideas in this direction. Nevertheless, the fact that Mr. Bell had shown and described an apparatus capable of actually transmitting speech and one which survives to-day as the receiving instrument, gave him a more positive claim which, in connection with other technical and legal facts, resulted in a final decision in his favor. The telautograph, like the harmonic telegraph, has not yet become of great practical value, although both are ingenious and beautiful devices. It would seem that Dr. Gray had been most unfortunate with his inventions in spite of his natural genius. It was not due, however, to lack of mental clearness or grasp, but more likely resulted from insufficient business ability. The books which he has recently written reflect very faithfully the mind of the man. To him science was not abstruse or formal, but a familiar, matter-of-fact and attractive subject. In a clear and picturesque style, he treats the principles and applications of electricity as well as other branches of science. These books could be understood sufficiently to be interesting even by the least technical of readers. On the other hand those well acquainted with the subjects would find at least a new point of view. It is notoriously difficult to write a really satisfactory scientific book of an elementary character. This inherent difficulty is magnified by the fact that most persons who undertake it are not masters of their subject. No such criticism can be made of Dr. Gray, and the lucidity of his ideas and his language are adapted to the task. The writer was well acquainted with Dr. Gray personally and knew his great enthusiasm for science, which is another quality necessary in the writer of an elementary work, in order to inspire his readers who are beginners or those who have comparatively little taste for such matters. For these reasons the series of books that Dr. Gray has written are to be recommended as interesting and instructive to the general or even casual

reader, but they are too conversational for use as text-books, except perhaps to supplement other more formal works.

F. B. CROCKER.

COLUMBIA UNIVERSITY.

March 6, 1901.

BOOKS RECEIVED.

Hygiene and Public Health. LOUIS PARKES and HENRY KENWOOD. Philadelphia, P. Blakiston's Son & Co.; London, H. K. Lewis. 1901. Pp. xix + 732.

The Agricultural Experiment Stations in the United States. A. C. TRUE and V. A. CLARK. Washington Government Printing Office. 1900. Pp. 636.

Experimental Psychology, a Manual of Laboratory Practice. EDWARD BRADFORD TITCHENER. New York and London, The Macmillan Company. 1901. Pp. xviii + 214.

The Human Nature Club. EDWARD THORNDIKE. New York, London and Bombay, Longmans, Green & Co. 1901. Pp. vii + 235.

Practical Organic Chemistry. JULIUS B. COHEN. New York and London, The Macmillan Company. 1899. Pp. xiii + 200.

Practical Gas-Fitting. PAUL N. HASLUCK. London, Paris, New York and Melbourne, Cassell & Company, Limited. 1900. Pp. 160.

A Manual of Elementary Science. R. A. GREGORY and A. T. SIMMONS. New York and London, The Macmillan Company. 1901. Pp. viii + 429.

The Industrial Revolution. CHARLES BEARD. New York, The Macmillan Company. 1901. Pp. x + 105. 40 cts.

SOCIETIES AND ACADEMIES.

BIOLOGICAL SOCIETY OF WASHINGTON.

THE 336th regular meeting was held on Saturday evening, March 9th.

C. W. Stiles presented a note on a recent visit to Texas, whither he had been called to investigate a disease of cattle ascribed to the presence of a parasite in the lungs. He had discovered that the disease was really due to a parasite of the genus *Strongylus* which infested the fourth stomach of the animals infected.

Barton W. Evermann read a paper on 'The Feeding Habits of the Coot and other Water Birds,' based upon observations made at Lake Maxinkuckee, Indiana, by Dr. Evermann and Mr. H. Walton Clark. In 1899 the observations